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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,673	HWANG, SUK-HA	
	Examiner	Art Unit	
	Andrew Janca	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,000,872 to Olah in view of US 6,030,424 to Matsumoto and CA 2378505 A1 to Mullay et al, published 1/18/01, which includes figures from PCT/US00/17767 omitted from the corresponding WIPO publication.

4. With regard to independent claim 1, Olah teaches an apparatus for producing and supplying water-in-oil emulsified fuel, comprising

a. an additive storage tank 64;

i. which is capable of storing an emulsifier that prevents the separation of water and oil when maintaining water-in-oil emulsified fuel at a high temperature.

ii. Being a statement of intended use, the intended contents and function of the tank fails to further limit the apparatus claim. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962);

b. an emulsion tank 122 capable of storing water-in-oil emulsified fuel and supplying the same to a boiler (17:66-18:1) from a center side area through a boiler supply line;

c. an additive flow meter 72 connected to the additive supply pump and capable of controlling an operation of the same such that the emulsifier is supplied by a predetermined supply amount;

d. a supply pump 46 capable of supplying B-C oil by a predetermined amount for mixing with water and an emulsifier;

e. a flow meter 56 connected to the B-C oil supply pump and capable of controlling an operation of the same such that the B-C oil is supplied by a predetermined supply amount;

f. a first mixer 108A connected both to an additive supply line that is connected to the additive flow meter and to a B-C oil supply line that is connected to the B-C oil flow meter (figures 1 and 2), the first mixer capable of mixing the B-C oil and the emulsifier;

g. a water cutoff valve 76 capable of supplying water by a predetermined amount for mixing with the B-C oil and the emulsifier;

h. a water flow meter 78 connected to the water cutoff valve and capable of controlling an operation of the same such that water is supplied by a predetermined supply amount;

i. a mixing ejector 96 connected both to a water supply line 74-94-100-50, which is connected to the water flow meter 78, and to the first mixer 108A, the mixing ejector capable of primarily uniformly mixing a raw material oil of B-C oil that may be supplied from an upstream reservoir and the emulsifier, and discharging a resulting mixture;

j. a mixer pump 99 connected to the mixing ejector capable of re-mixing the raw material oil supplied from the mixing ejector; and

k. a second mixer 108B (figures 1 and 2) connected to the mixer pump 99 capable of remixing the primarily mixed raw material oil and the emulsified fuel to

uniformly emulsify a resulting mixture to uniform minute particles, then supplying a result to the emulsion tank through the circulation electric heater;

i. wherein the additive supply pump, the B-C oil supply pump, the water cutoff valve, the additive flow meter, the B-C oil flow meter, and the water flow meter may be operated when a LOW signal of the level switch of the emulsion tank is transmitted, the additive flow pump, the B-C oil supply, and the water cutoff valve, to which are connected respectively the additive flow meter, the B-C oil flow meter, and the water flow meter, discontinuing operation according to a discontinue signal transmitted when predetermined values of these flow meters are reached, and wherein following the supply of a predetermined amount of the raw materials, emulsified fuel mixed in a circulation system of the emulsion tank, the mixer pump, the second mixer, and the circulation electric heater is continuously circulated even if raw material supply is stopped such that emulsified fuel that is always in a uniform state is supplied while maintaining a predetermined ratio, a predetermined moisture particle state, and a predetermined temperature.

ii. This limitation is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

5. Olah teaches a circulation electric heater 22 mounted within a vessel 16 to reduce free water within the circulating emulsion ("FWKO unit", 5:30-6:22); and also teaches a heat exchanger 120 mounted within or in series with the emulsion tank 122, capable of uniformly maintaining a temperature of the supplied water-in-oil emulsified fuel (12:25-40); but does not explicitly teach that the heater be electric, or be mounted within or to the side of the emulsion tank. However, it would have been obvious to one of ordinary skill in the art to mount a circulation electric heater within the emulsion tank of Olah such as that of his FWKO vessel: the motivation would have been to allow the emulsified crude to be heated to any pre-set temperature in order to separate off excess

water and gas (5:67-6:3). Although Olah teaches his circulation electric heater to be mounted on the bottom of his FWKO vessel (figure 1) and not on the side, since such a rearrangement would not have modified the operation of his device this particular placement on the side rather than the bottom would have been an obvious matter of design choice. See *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950), and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

6. Olah does not explicitly teach a level switch mounted to the emulsion tank to adjust a storage amount of the water-in-oil emulsified fuel, which may be established to match a usage load of the boiler, or an additive supply pump connected to the additive storage tank capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. However, Matsumoto teaches a level switch 59 to monitor the liquid level in an emulsifying tank 51, coupled to a control system capable of matching its storage amount to a usage load of his boiler 24 (6:67-7:6; 6:5); and further teaches an additive supply pump 35 connected to his additive storage tank 31, capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. Olah and Matsumoto are analogous arts because they are from the same field of endeavor, providing mixing plants for producing emulsified fuels. At the time the invention was made, it would have been obvious to one of ordinary skill in the fuel arts to provide the level switch of Matsumoto to the emulsification tank of Olah, and also an additive supply pump as in Matsumoto to the additive supply line of Olah: the motivations would have been to ensure an optimum combustion efficiency (Matsumoto 6:59-64) and to ensure delivery of the additive solution to the water tank 37 (6:28-30) respectively.

7. Olah teaches that the water-in-oil emulsified fuel may be recirculated upstream of the emulsion tank (13:44-54, figure 2) and downstream of the emulsion tank (32:44-69; figure 3); but does not teach that the emulsified fuel may be recirculated through the mixer pump through a connection from the latter to the lower end of the emulsion tank. However, Mullay et al disclose a method for producing water-in-oil emulsified fuel (17:24-18:4) including a mixer pump 10 connected to a mixing ejector 38 supplying raw hydrocarbon oil, and connected to the emulsion tank, one of (12, 22), through a line

connected to the emulsion tank's lower end, one of (130, 135), to re-mix the raw material oil supplied from the mixing ejector with the emulsified fuel supplied from the emulsion tank (6:11-18, 6:8-18, 13:6-15; see figure 1). It would have been obvious to one of ordinary skill in the art to try implementing the process disclosed by Mullay et al in light of the illustrations provided in their publication. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recirculate the emulsified fuel from the emulsion tank back through the mixer pump to re-mix with new oil, as do Mullay et al: the motivation would have been to avoid settling in the emulsion tank (Mullay et al 6:11-18), or alternatively to achieve a desired emulsion quality (Mullay et al 8:26-31).

8. With regard to independent claim 17, Olah teaches an apparatus for producing and supplying water-in-oil emulsified fuel, comprising

a. an additive storage tank 64;

i. which is capable of storing an emulsifier that prevents the separation of water and oil when maintaining water-in-oil emulsified fuel at a high temperature.

ii. Being a statement of intended use, the intended contents and function of the tank fails to further limit the apparatus claim. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962);

b. an emulsion tank 122 having a capacity of at least a first batch raw material supply amount, and storing and mixing water-in-oil emulsified fuel. Since the size of a batch is dependent upon the choice of the operator, defining the capacity of a tank in terms of “batches” is a statement of intended use which fails to further limit the claim;

c. an additive flow meter 72 connected to the additive supply pump and capable of controlling an operation of the same such that the emulsifier is supplied by a predetermined supply amount;

d. a supply pump 46 capable of supplying B-C oil by a predetermined amount for mixing with water and an emulsifier;

e. a flow meter 56 connected to the B-C oil supply pump and capable of controlling an operation of the same such that the B-C oil is supplied by a predetermined supply amount;

f. a first mixer 108A connected both to an additive supply line that is connected to the additive flow meter and to a B-C oil supply line that is connected to the B-C oil flow meter (figures 1 and 2), the first mixer capable of mixing the B-C oil and the emulsifier;

g. a water cutoff valve 76 capable of supplying water by a predetermined amount for mixing with the B-C oil and the emulsifier;

h. a water flow meter 78 connected to the water cutoff valve and capable of controlling an operation of the same such that water is supplied by a predetermined supply amount;

i. a mixing ejector 96 connected both to a water supply line 74-94-100-50, which is connected to the water flow meter 78, and to the first mixer 108A, the mixing ejector primarily uniformly mixing a raw material oil of the B-C oil and the emulsifier, and discharging a resulting mixture;

j. a mixer pump 99 connected to the mixing ejector capable of re-mixing the raw material oil supplied from the mixing ejector;

k. a service tank (17:44-47) receiving mixed water-in-oil emulsified fuel from the emulsion tank 122 through an emulsified fuel transporting pump (16:33), which is connected to a lower end of the emulsion tank, temporarily storing the received water-in-oil emulsified fuel, and supplying the water-in-oil emulsified fuel to the boiler through a boiler supply line 302 connected to a bottom end of the service tank (17:66-18:3, in particular 18:1-3); and

l. a second mixer 108B (figures 1 and 2) connected to the mixer pump 99 capable of remixing the primarily mixed raw material oil and the emulsified fuel to uniformly emulsify a resulting mixture to uniform minute particles, then supplying a result to the emulsion tank through the circulation electric heater;

i. wherein the additive supply pump, the B-C oil supply pump, the water cutoff valve, the additive flow meter, the B-C oil flow meter, and the water flow meter may be operated when a LOW signal of the level switch of the emulsion tank is transmitted, the additive flow pump, the B-C oil supply, and the water cutoff valve, to which are connected respectively the additive flow meter, the B-C oil flow meter, and the water flow meter, discontinuing operation according to a discontinue signal transmitted when predetermined values of these flow meters are reached, and wherein following the supply of a predetermined amount of the raw materials, emulsified fuel mixed in a circulation system of the emulsion tank, the mixer pump, the second mixer, and the circulation electric heater is continuously circulated even if raw material supply is stopped such that emulsified fuel that is always in a uniform state is supplied while maintaining a predetermined ratio, a predetermined moisture particle state, and a predetermined temperature.

ii. This limitation is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

9. Olah teaches a circulation electric heater 22 mounted within a vessel 16 to reduce free water within the circulating emulsion ("FWKO unit", 5:30-6:22); and also teaches a heat exchanger 120 mounted within or in series with the emulsion tank 122, capable of uniformly maintaining a temperature of the supplied water-in-oil emulsified fuel (12:25-40); but does not explicitly teach that the heater be electric, or be mounted within or to the side of the emulsion tank. However, it would have been obvious to one of ordinary skill in the art to mount a circulation electric heater within the emulsion tank of Olah such as that of his FWKO vessel: the motivation would have been to allow the emulsified crude to be heated to any pre-set temperature in order to separate off excess water and gas (5:67-6:3). Although Olah teaches his circulation electric heater to be mounted on the bottom of his FWKO vessel (figure 1) and not on the side, since such a

rearrangement would not have modified the operation of his device this particular placement on the side rather than the bottom would have been an obvious matter of design choice. See *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950), and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

10. Olah does not explicitly teach a level switch mounted to the emulsion tank to adjust a storage amount of the water-in-oil emulsified fuel, which may be established to match a usage load of the boiler, or an additive supply pump connected to the additive storage tank capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. However, Matsumoto teaches a level switch 59 to monitor the liquid level in an emulsifying tank 51, coupled to a control system capable of matching its storage amount to a usage load of his boiler 24 (6:67-7:6; 6:5); and further teaches an additive supply pump 35 connected to his additive storage tank 31, capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. Olah and Matsumoto are analogous arts because they are from the same field of endeavor, providing mixing plants for producing emulsified fuels. At the time the invention was made, it would have been obvious to one of ordinary skill in the fuel arts to provide the level switch of Matsumoto to the emulsification tank of Olah, and also an additive supply pump as in Matsumoto to the additive supply line of Olah: the motivations would have been to ensure an optimum combustion efficiency (Matsumoto 6:59-64) and to ensure delivery of the additive solution to the water tank 37 (6:28-30) respectively.

11. Olah teaches that the water-in-oil emulsified fuel may be recirculated upstream of the emulsion tank (13:44-54, figure 2) and downstream of the emulsion tank (32:44-69; figure 3); but does not teach that the emulsified fuel may be recirculated through the mixer pump through a connection from the latter to the lower end of the emulsion tank. However, Mullay et al disclose a method for producing water-in-oil emulsified fuel (17:24-18:4) including a mixer pump 10 connected to a mixing ejector 38 supplying raw hydrocarbon oil, and connected to the emulsion tank, one of (12, 22), through a line connected to the emulsion tank's lower end, one of (130, 135), to re-mix the raw material oil supplied from the mixing ejector with the emulsified fuel supplied from the

emulsion tank (6:11-18, 6:8-18, 13:6-15; see figure 1). It would have been obvious to one of ordinary skill in the art to try implementing the process disclosed by Mullay et al in light of the illustrations provided in their publication. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recirculate the emulsified fuel from the emulsion tank back through the mixer pump to re-mix with new oil, as do Mullay et al: the motivation would have been to avoid settling in the emulsion tank (Mullay et al 6:11-18), or alternatively to achieve a desired emulsion quality (Mullay et al 8:26-31).

12. With regard to independent claim 21, Olah teaches an apparatus for producing and supplying water-in-oil emulsified fuel, comprising

a. an additive storage tank 64;

i. which is capable of storing an emulsifier that prevents the separation of water and oil when maintaining water-in-oil emulsified fuel at a high temperature.

ii. Being a statement of intended use, the intended contents and function of the tank fails to further limit the apparatus claim. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962);

b. an emulsion tank 122 capable of storing water-in-oil emulsified fuel and supplying the same to a boiler (17:66-18:1) from a center side area through a boiler supply line;

c. an additive flow meter 72 connected to the additive supply pump and capable of controlling an operation of the same such that the emulsifier is supplied by a predetermined supply amount;

d. a supply pump 46 capable of supplying B-C oil by a predetermined amount for mixing with water and an emulsifier;

e. a flow meter 56 connected to the B-C oil supply pump and capable of controlling an operation of the same such that the B-C oil is supplied by a predetermined supply amount;

f. a first mixer 108A connected both to an additive supply line that is connected to the additive flow meter and to a B-C oil supply line that is connected to the B-C oil flow meter (figures 1 and 2), the first mixer capable of mixing the B-C oil and the emulsifier;

g. a water cutoff valve 76 capable of supplying water by a predetermined amount for mixing with the B-C oil and the emulsifier;

h. a water flow meter 78 connected to the water cutoff valve and capable of controlling an operation of the same such that water is supplied by a predetermined supply amount;

i. a mixer pump 99 connected to the second mixer capable of re-mixing the raw material oil supplied from the mixing ejector;

j. a second mixer 108B (figures 1 and 2) connected to a water supply line that is connected to the water flow meter and connected to the first mixer to primarily uniformly mix water in raw material oil of the B-C oil and the emulsifier;

k. a mixer pump 99 connected to the second mixer and a lower end of the emulsion tank capable of remixing raw material oil supplied from the second mixer and the emulsified fuel supplied from the emulsion tank; a circulation electric heater 120 connected to the mixer pump capable of uniformly maintaining mixed raw material oil supplied therefrom at a predetermined temperature;

l. and a third mixer 108 (same reference numeral as the first and second mixers: figure 3, 13:44-54; see also 32:15-18) connected to the circulation electric heater capable of mixing raw material oil supplied therefrom and the emulsified fuel to uniformly emulsify a resulting mixture to uniform minute particles, then supplying a result to the emulsion tank;

i. wherein the additive supply pump, the B-C oil supply pump, the water cutoff valve, the additive flow meter, the B-C oil flow meter, and the water flow meter operate when a LOW signal of the level switch of the emulsion tank is transmitted, the additive flow pump, the B-C oil supply pump, and the water cutoff valve, to which are connected respectively the

additive flow meter, the B-C oil flow meter, and the water flow meter, discontinuing operation according to a discontinue signal transmitted when predetermined values of these flow meters are reached, and wherein following the supply of a predetermined amount of the raw materials, emulsified fuel mixed in a circulation system of the emulsion tank, the mixer pump, the circulation electric heater, and the third mixer is continuously circulated even if raw material supply is stopped such that emulsified fuel that is always in a uniform state is supplied while maintaining a predetermined ratio, a predetermined moisture particle state, and a predetermined temperature.

ii. This limitation is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

13. Olah teaches a circulation electric heater 22 mounted within a vessel 16 to reduce free water within the circulating emulsion ("FWKO unit", 5:30-6:22); and also teaches a heat exchanger 120 mounted within or in series with the emulsion tank 122, capable of uniformly maintaining a temperature of the supplied water-in-oil emulsified fuel (12:25-40); but does not explicitly teach that the heater be electric, or be mounted within or to the side of the emulsion tank. However, it would have been obvious to one of ordinary skill in the art to mount a circulation electric heater within the emulsion tank of Olah such as that of his FWKO vessel: the motivation would have been to allow the emulsified crude to be heated to any pre-set temperature in order to separate off excess water and gas (5:67-6:3). Although Olah teaches his circulation electric heater to be mounted on the bottom of his FWKO vessel (figure 1) and not on the side, since such a rearrangement would not have modified the operation of his device this particular placement on the side rather than the bottom would have been an obvious matter of design choice. See *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950), and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

14. Olah does not explicitly teach a level switch mounted to the emulsion tank to adjust a storage amount of the water-in-oil emulsified fuel, which may be established to match a usage load of the boiler, or an additive supply pump connected to the additive storage tank capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. However, Matsumoto teaches a level switch 59 to monitor the liquid level in an emulsifying tank 51, coupled to a control system capable of matching its storage amount to a usage load of his boiler 24 (6:67-7:6; 6:5); and further teaches an additive supply pump 35 connected to his additive storage tank 31, capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. Olah and Matsumoto are analogous arts because they are from the same field of endeavor, providing mixing plants for producing emulsified fuels. At the time the invention was made, it would have been obvious to one of ordinary skill in the fuel arts to provide the level switch of Matsumoto to the emulsification tank of Olah, and also an additive supply pump as in Matsumoto to the additive supply line of Olah: the motivations would have been to ensure an optimum combustion efficiency (Matsumoto 6:59-64) and to ensure delivery of the additive solution to the water tank 37 (6:28-30) respectively.

15. Olah teaches that the water-in-oil emulsified fuel may be recirculated upstream of the emulsion tank (13:44-54, figure 2) and downstream of the emulsion tank (32:44-69; figure 3); but does not teach that the emulsified fuel may be recirculated through the mixer pump through a connection from the latter to the lower end of the emulsion tank. However, Mullay et al disclose a method for producing water-in-oil emulsified fuel (17:24-18:4) including a mixer pump 10 connected to a second mixer 38 supplying raw hydrocarbon oil, and connected to the emulsion tank, one of (12, 22), through a line connected to the emulsion tank's lower end, one of (130, 135), to re-mix the raw material oil supplied from the mixing ejector with the emulsified fuel supplied from the emulsion tank (6:11-18, 6:8-18, 13:6-15; see figure 1). It would have been obvious to one of ordinary skill in the art to try implementing the process disclosed by Mullay et al in light of the illustrations provided in their publication. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recirculate the

emulsified fuel from the emulsion tank back through the mixer pump to re-mix with new oil, as do Mullay et al: the motivation would have been to avoid settling in the emulsion tank (Mullay et al 6:11-18), or alternatively to achieve a desired emulsion quality (Mullay et al 8:26-31).

16. With regard to independent claim 23, Olah teaches an apparatus for producing and supplying water-in-oil emulsified fuel, comprising

a. an additive storage tank 64;

i. which is capable of storing an emulsifier that prevents the separation of water and oil when maintaining water-in-oil emulsified fuel at a high temperature.

ii. Being a statement of intended use, the intended contents and function of the tank fails to further limit the apparatus claim. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962);

b. an emulsion tank 122 having a capacity of at least a second batch raw material supply amount, and storing and mixing water-in-oil emulsified fuel. Since the size of a batch is dependent upon the choice of the operator, defining the capacity of a tank in terms of "batches" is a statement of intended use which fails to further limit the claim;

c. an additive flow meter 72 connected to the additive supply pump and capable of controlling an operation of the same such that the emulsifier is supplied by a predetermined supply amount;

d. a supply pump 46 capable of supplying B-A oil by a predetermined amount for mixing with water and an emulsifier;

e. a flow meter 56 connected to the B-A oil supply pump and capable of controlling an operation of the same such that the B-A oil is supplied by a predetermined supply amount;

f. a first mixer 108A connected both to an additive supply line that is connected to the additive flow meter and to a B-A oil supply line that is connected

to the B-A oil flow meter (figures 1 and 2), the first mixer capable of mixing the B-A oil and the emulsifier;

g. a water cutoff valve 76 capable of supplying water by a predetermined amount for mixing with the B-A oil and the emulsifier;

h. a water flow meter 78 connected to the water cutoff valve and capable of controlling an operation of the same such that water is supplied by a predetermined supply amount;

i. a second mixer 108B connected to a water supply line that is connected to the water flow meter and connected to the first mixer to primarily uniformly mix water in raw material oil of the B-A oil and the emulsifier;

j. a mixer pump 99 connected to the second mixer capable of re-mixing the raw material oil supplied from the mixing ejector;

k. a third mixer 108 (same reference numeral as the first and second mixers: figure 3, 13:44-54; see also 32:15-18) connected to the mixer pump capable of mixing primarily mixed raw material oil supplied therefrom and the emulsified fuel to uniformly emulsify a resulting mixture to uniform minute particles, then supplying a result to the emulsion tank;

i. wherein the additive supply pump, the B-A oil supply pump, the water cutoff valve, the additive flow meter, the B-A oil flow meter, and the water flow meter operate when a LOW signal of the level switch of the emulsion tank is transmitted, the additive flow pump, the B-A oil supply pump, and the water cutoff valve, to which are connected respectively the additive flow meter, the B-A oil flow meter, and the water flow meter, discontinuing operation according to a discontinue signal transmitted when predetermined values of these flow meters are reached, and wherein following the supply of a predetermined amount of the raw materials, emulsified fuel mixed in a circulation system of the emulsion tank, the mixer pump, and the third mixer is continuously circulated even if raw material supply is stopped such that emulsified fuel that is always in a

uniform state is supplied while maintaining a predetermined ratio, a predetermined moisture particle state, and a predetermined temperature.

ii. This limitation is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

17. Olah teaches a circulation electric heater 22 mounted within a vessel 16 to reduce free water within the circulating emulsion ("FWKO unit", 5:30-6:22); and also teaches a heat exchanger 120 mounted within or in series with the emulsion tank 122, capable of uniformly maintaining a temperature of the supplied water-in-oil emulsified fuel (12:25-40); but does not explicitly teach that the heater be electric, or be mounted within or to the side of the emulsion tank. However, it would have been obvious to one of ordinary skill in the art to mount a circulation electric heater within the emulsion tank of Olah such as that of his FWKO vessel: the motivation would have been to allow the emulsified crude to be heated to any pre-set temperature in order to separate off excess water and gas (5:67-6:3). Although Olah teaches his circulation electric heater to be mounted on the bottom of his FWKO vessel (figure 1) and not on the side, since such a rearrangement would not have modified the operation of his device this particular placement on the side rather than the bottom would have been an obvious matter of design choice. See *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950), and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

18. Olah does not explicitly teach a level switch mounted to the emulsion tank to adjust a storage amount of the water-in-oil emulsified fuel, which may be established to match a usage load of the boiler, or an additive supply pump connected to the additive storage tank capable of supplying at a predetermined amount an emulsifier stored therein to allow for mixing of the emulsifier with water and B-C oil. However, Matsumoto teaches a level switch 59 to monitor the liquid level in an emulsifying tank 51, coupled to a control system capable of matching its storage amount to a usage load of his boiler 24 (6:67-7:6; 6:5); and further teaches an additive supply pump 35 connected to his additive storage tank 31, capable of supplying at a predetermined amount an emulsifier

stored therein to allow for mixing of the emulsifier with water and B-C oil. Olah and Matsumoto are analogous arts because they are from the same field of endeavor, providing mixing plants for producing emulsified fuels. At the time the invention was made, it would have been obvious to one of ordinary skill in the fuel arts to provide the level switch of Matsumoto to the emulsification tank of Olah, and also an additive supply pump as in Matsumoto to the additive supply line of Olah: the motivations would have been to ensure an optimum combustion efficiency (Matsumoto 6:59-64) and to ensure delivery of the additive solution to the water tank 37 (6:28-30) respectively.

19. Olah teaches that the water-in-oil emulsified fuel may be recirculated upstream of the emulsion tank (13:44-54, figure 2) and downstream of the emulsion tank (32:44-69; figure 3); but does not teach that the emulsified fuel may be recirculated through the mixer pump through a connection from the latter to the lower end of the emulsion tank. However, Mullay et al disclose a method for producing water-in-oil emulsified fuel (17:24-18:4) including a mixer pump 10 connected to a second mixer 38 supplying raw hydrocarbon oil, and connected to the emulsion tank, one of (12, 22), through a line connected to the emulsion tank's lower end, one of (130, 135), to re-mix the raw material oil supplied from the mixing ejector with the emulsified fuel supplied from the emulsion tank (6:11-18, 6:8-18, 13:6-15; see figure 1). It would have been obvious to one of ordinary skill in the art to try implementing the process disclosed by Mullay et al in light of the illustrations provided in their publication. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recirculate the emulsified fuel from the emulsion tank back through the mixer pump to re-mix with new oil, as do Mullay et al: the motivation would have been to avoid settling in the emulsion tank (Mullay et al 6:11-18), or alternatively to achieve a desired emulsion quality (Mullay et al 8:26-31).

20. The additional elements of claim 2, a steam coil mounted to an inner surface of the additive storage tank for maintaining the emulsifier stored therein at a predetermined temperature, are taught by Olah who teaches a heat exchanger 104 in order to control and provide the emulsifying composition with a sufficient temperature for optimal mixing (9:66-10:30) and Matsumoto who teaches a steam coil 39 for heating

the emulsifying additive solution in its precursor tank mixed with the emulsifying water (6:45-47).

21. Claim 3, specifying that the steam coil maintains the emulsifier stored in the additive storage tank at a temperature of about 60-110 degrees C, is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

22. The additional element of claim 4, an electric heater mounted to a lower output side of the additive storage tank capable of uniformly maintaining the emulsifier exiting the additive storage tank at a predetermined temperature such that stable additive supply is ensured during initial operation, is also taught by Matsumoto (6:46-47).

23. Claim 5, specifying that the electric heater maintains the emulsifier stored in the additive storage tank at a temperature of about 60-110 degrees C, is a statement of intended use. It has been held that a statement of intended use in an apparatus claim fails to distinguish over a prior art apparatus. See *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962).

24. Claim 6, specifying that the capacity of the emulsion tank is at least two batches of a raw material supply amount, is a statement of intended use, since the size of a batch is not a standard measurement quantifiable independently of the desired operation of the apparatus, but dependent upon the choice of the operator.

25. The additional element of claim 7, specifying a temperature retaining heater mounted to an exterior of the emulsion tank to maintain a temperature of the water-in-oil emulsified fuel stored in the emulsion tank at a predetermined level, is taught by Matsumoto (6:55-58): although he teaches that this particular heater be a steam coil, it would have been a matter of obvious design choice to instead choose an electric heater, in line with the functional equivalence between the two power methods taught elsewhere by Matsumoto (6:45-47).

26. Claims 8 and 9, specifying that the electric heater maintains the emulsifier stored in the additive storage tank at a temperature of about 60-80 degrees C, is a statement of intended use.

27. Claims 10, 11, and 12, specifying particular ratios of fluids to be operated on by the claimed apparatus, are statements of intended use.

28. With regard to claims 13, 14, 18, 22, and 24, Olah teaches that the first and second mixers 108A and 108B and the third mixer 108 may be single-type line mixers (36:63-37:50; figures 8-12) or double-type line mixers (36:13-62; figures 4-7), and may also include a mixing ejector 96 in series with the static mixers (9:53-63).

29. The additional element of claim 15, specifying two pumps in parallel between the emulsion tank and the second mixer, are an obvious duplication of parts over Olah, and an obvious combination of parts over Olah and Matsumoto. Olah teaches two or more (32:12-18) mixers 108A,B in parallel (figure 2) so that the flow of the emulsifying mixture and crude may be conducted at distinguishable or different shear rates; and further provides flow and flow rate control valves 134 and 136 within the two conduits (31:37-65). Olah explicitly teaches only one pump 99 in parallel with the circuit defined by the mixers and the emulsion tank 122 (figure 1). It would have been obvious to provide more than one pump in parallel, for the same reasons as Olah provides two or more mixers and valves in parallel: namely, so that the flow of the emulsifying mixture and crude may be conducted at distinguishable or different shear rates (31:50-54). Alternatively, it would have been obvious to provide each separate line requiring flow control to the extent that each has already been provided with a valve as in Olah, with a pump of its own as well, as does Matsumoto with his pump 40: the motivation would have been to ensure delivery of the oil-water mixture to the emulsion tank (Matsumoto 6:48-50).

30. The additional element of claim 16 is taught by Olah, who teaches a tube, the conduit through which the oil-in-water emulsion flows through the heat exchanger 120 (12:24-26), and a shell, the outer shell of the heat exchanger containing the conduit (figure 1).

31. The additional element of claim 19 is taught by Matsumoto, who teaches a level switch 66 mounted in his service tank 61 to allow for adjustment of the amount of the water-in-oil emulsified fuel (7:19-25); the additional limitations of this claim are statements of intended use, which fail to further limit the apparatus claim.

32. The additional elements of claim 20 are taught by Matsumoto, who teaches a temperature retaining steam heater 63 mounted to the service tank 61 such that the temperature of the water-in-oil emulsified fuel stored therein may be maintained at a predetermined temperature; and who also teaches the functional equivalence of steam and electric heaters (6:45-47), which substitution as well as the explicit arrangement of the heater on the outer circumference of the service tank are matters of design choice that would have been obvious to one of ordinary skill in the art.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **this action is made final.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Janca whose telephone number is (571) 270-5550. The examiner can normally be reached on M-Th 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on (571) 272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.
AJJ

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